

## REMARKS

The Office Action mailed August 7, 2003 has been carefully reviewed and the following remarks are submitted in response thereto. Claims 16–33 are pending.

The proposed amendments to the drawings and specification submitted on June 24, 2003 are disapproved under 37 C.F.R. § 1.121(a)(6) as introducing new matter into the application. Claims 24–29 are rejected under 35 U.S.C. § 112, 1<sup>st</sup> paragraph, based on the as-filed specification. The Applicant traverses these rejections.

Claims 16, 17, 19–23 and 30–33 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,073,971 to Schaeffer ("Schaeffer") in view of U.S. Patent No. 5,365,571 to Rha et al. ("Rha"). The Applicant also traverses these rejections.

Claims 16–23 and 30–33 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1–8 of U.S. Patent No. 6,002,935. The Applicant traverses these provisional double patenting rejections at this time.

In view of the following remarks, the Applicant respectfully requests that the Examiner reconsider and withdraw the pending § 112 and § 103 rejections, and approve the amendments to the drawings and specification filed on June 24, 2003.

**No New Subject Matter Has Been Introduced Into the Application**

FIG. 10 and Page 12 of the specification were amended to explicitly identify the distance between cell C1 and cell C2, in the first tier of NBTC Type I cells, as "1.5 R," as well as the distance between cell C3 and cell C4, in the second tier of NBTC Type II cells, as "1.5 R." These distances are easily determined by inspection of FIG. 10 (as-filed), and do not represent new subject matter introduced into the application.

As depicted within FIG. 10 (as filed), each cell includes three hexagonal sectors defined within a circular footprint of radius R. *See, also*, FIGS. 7 and 9; Application at Pages 9 to 12. Due to this interlocking, hexagonal cell geometry, the circular footprints of adjacent cells overlap one another, and the separation distance between adjacent cells can be easily determined by inspection. For example, the upper portion of cell C2's circular footprint, located at distance of 1.0 R from the center of cell C2, bisects the center of cell C1's lower sector (sector "3"), located 0.5 R from the center of cell C1. Thus, the separation distance between the center of cell C2 and the center of cell C1 is 1.5 R. Similarly, the distance between the

center of cell C3 and the center of cell C4 is also 1.5 R. Consequently, the separation distance between adjacent cells may be defined with respect to the radius of the circular footprint of each cell. Thus, the separation distance 1.5 R does not represent new subject matter.

The Examiner opines that "the distance d mentioned in the amended specification is the reuse distance and is a desired parameter, not a fix [sic] parameter defined by the hexagonal geometry depicted therein ... and present new subject matter situations [sic] with the introduction of the reuse distance of 1.5 R" (Office Action at Pages 2-3). The Applicant respectfully submits that the Examiner has confused adjacent cell separation distance, i.e., the distance 1.5 R depicted within FIG. 10 (as amended), with "reuse distance." As explained above, the distance 1.5 R is the separation distance between adjacent cells (e.g., C1 and C2), and not the separation distance between cells having the same frequency set assignment (e.g., C1 and C1). Therefore, the separation distance 1.5 R is not "reuse distance" because it is not the distance between cells with the same frequency set assignments. (Compare amended FIG. 10 to FIG. 7 depicting a different embodiment having a cell radius R and a reuse distance  $D = 2.6 R$  for cell type "1").

Accordingly, the Applicant requests that the Examiner approve the amendments to the drawings and specification filed on June 24, 2003.

**Claims 24-29 Satisfy 35 U.S.C. § 112, 1<sup>st</sup> Paragraph**

Claim 24 is directed to a wireless communications system and recites, in pertinent part, "a first set of base stations provided in a first tier are NBTC Type I base stations that are separated from one another by a distance of 1.5 R, and a second set of base stations provided in a second tier, adjacent to the first tier, are NBTC Type II base stations that are separated from one another by a distance of 1.5 R." As discussed above, FIG. 10 (as-filed) depicts this separation distance and, therefore, the amendments to FIG. 10 and Page 12 of the specification are allowable. Consequently, claim 24 satisfies 35 U.S.C. § 112, 1<sup>st</sup> paragraph. Claims 25-27, depending therefrom, are also allowable.

Claim 28, depending from claim 16, is fully supported by the specification and satisfies 35 U.S.C. § 112, 1<sup>st</sup> paragraph. The Applicant is unclear as to the merits of this rejection, as claims 16 and 28 do not recite the distance "1.5 R."

Claim 29, depending from claim 21, is fully supported by the specification and satisfies 35 U.S.C. § 112, 1<sup>st</sup> paragraph. The Applicant is unclear as to the merits of this rejection, as claims 21 and 29 do not recite the distance "1.5 R."

Accordingly, the Applicant requests that the Examiner reconsider and withdraw the pending § 112, 1<sup>st</sup> paragraph rejections.

#### **The Provisional Double Patenting Rejections Are Traversed**

The provisional obviousness-type double patenting rejections directed to claims 16–23 and 30–33 are traversed. The Applicant notes that the scope of claims 16–23 and 30–33 may change during prosecution, and that no indication of allowable subject matter has yet been offered by the Examiner.

The Applicant therefore submits that a terminal disclaimer will be filed to overcome the obviousness-type double patenting rejection(s), if warranted, when the Examiner indicates that, but for any obviousness-type double patenting rejections, the application is in condition for allowance.

#### **The Pending Claims Are Patentable Over the Cited References**

Claims 16, 17, 19–23 and 30–33 stand rejected as being obvious over Schaeffer in view of Rha. The Applicant respectfully disagrees, and submits that both Schaeffer and Rha fail to teach or suggest the use of six-sector frequency reuse patterns within three-sector cells. Furthermore, none of the other references cited by the Examiner provide this missing subject matter.

Schaeffer is directed to a cellular radiotelephone communications system, and more particularly, to a system including a plurality of hexagonal cells that are made up of an array of directional sector antennas. The antennas are centrally located in the cell, and each radiates into a 60° area, or sector, of the hexagonal cell. Each antenna in the cell is assigned a group of frequencies, and the frequency assignments may be repeated 2 times in a 4 cell repeat pattern, "effectively forming a two cell reuse pattern." See, Col. 2, lines 36–45. FIG. 5 depicts a frequency reuse pattern for the "preferred embodiment" of the invention. Each of the hexagonal cells are divided into 6 sectors and each of the sectors is assigned one of 12 frequency groups. Thus, Schaeffer's frequency reuse pattern requires six sectors per cell with six centrally-located, directional antenna per cell, where each sector is separated by 60° and

each directional antenna radiates into a 60° area (i.e., 1/6) of the cell. Moreover, Schaeffer is entirely silent on whether more, or less, than 12 frequency groups may be assigned.

Schaeffer fails to teach or suggest any more, or any less, than the formation of a hexagonal cell by grouping six sectors together at a spacing of 60°. Furthermore, Schaeffer fails to disclose that two sectors can be combined together, or that a beamwidth of more than 60° may be employed. In other words, Schaeffer fails to teach or suggest that a hexagonal cell can include anything other than 6 sectors, grouped together at a spacing of 60°. Moreover, Schaeffer teaches away from using a beamwidth wider than 60° by reciting the benefits of his six-sector architecture. For example, in his discussion of the prior art, Schaeffer teaches that "in order to increase frequency reuse, the antenna beam pattern is narrowed from 120° to 60°. Since a 120° antenna beam covers a wider area, it will interfere with more co-channel cells than a 60° antenna beam ... by reducing the beam width and spatially arranging antennas ... allows greater frequency reuse" (Col. 2, lines 8–20).

Consequently, Schaeffer fails to disclose "base stations having sectored antennae defining three generally hexagonal sectors within the cell," as recited by claim 16, "six frequency sets," as recited by claim 21, or "each cell consisting of three sectors," as recited by claim 30. Moreover, Schaeffer does not teach or suggest "a first set of base stations provided in a first tier are NBTC Type I base stations that are separated from one another by a distance of 1.5 R, and a second set of base stations provided in a second tier, adjacent to the first tier, are NBTC Type II base stations that are separated from one another by a distance of 1.5 R," as recited by claim 24.

Rha is directed to a cellular radio-telephone system, and, more particularly, to a cellular system including clusters of sectorized, hexagonal cells. Rha discloses that four cells may be grouped into a cluster (e.g., A, B, C and D), and that each cell may include three sectors (e.g., 1, 2 and 3), or six sectors (e.g., 1, 2, 3, 4, 5 and 6). The frequency allocation is first divided into four frequency sets, and then each frequency set may be subdivided into either three or six subsets, resulting in either 12 or 24 frequency subsets, respectively, assigned to each cluster (e.g., for three sector cells: A-1, A-2, A-3, B-1, B-2, B-3, C-1, C-2, C-3, D-1, D-2 and D-3, etc.). Each of these frequency subsets is unique, resulting in a frequency reuse factor of  $K=4$ . See, e.g., FIGS. 1, 4; Col. 2 line 58 to Col. 3 line 46. Rha is entirely silent on whether his system may include six channel sets instead of 12 or 24. Furthermore, Rha fails to disclose

that each channel set may be allocated to two sectors within a cluster of four base stations. Moreover, Rha fails to teach or suggest that his system supports a frequency reuse factor of two.

Consequently, Rha fails to disclose "a frequency reuse pattern in which each frequency set occurs twice in a cluster of four cells," as recited by claim 16, "six frequency sets and each frequency set is allocated to two sectors within the cluster of four base stations," as recited by claim 21, or a "plurality of frequency sets are assigned to each cell cluster to create a frequency reuse factor of two," as recited by claim 30. Moreover, Rha does not teach or suggest "a first set of base stations provided in a first tier are NBTC Type I base stations that are separated from one another by a distance of  $1.5 R$ , and a second set of base stations provided in a second tier, adjacent to the first tier, are NBTC Type II base stations that are separated from one another by a distance of  $1.5 R$ ," as recited by claim 24.

Accordingly, both Schaeffer and Rha fail to disclose many features recited by claims 16–33. Furthermore, the Applicant submits that Schaeffer and Rha fail to establish a prima facie case of obviousness when considered in combination.

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ 2d 1438 (Fed. Cir. 1991).<sup>1</sup>

**(1) *The Examiner Has Not Identified Any Teaching, Suggestion, or Motivation to Combine the References***

The Examiner has not identified any teaching, suggestion, or motivation in the prior art to combine these references to arrive at the claimed invention. In establishing obviousness, the Office has the burden of pointing to some suggestion or motivation to combine teaching the references. While a reference can be utilized for all that it teaches, focusing on isolated portions of the reference or picking and choosing only that which supports a holding of obviousness is improper. See, e.g., *Panduit Corp. v. Dennison Mfg. Co.*, 1 U.S.P.Q.2d 1593, 1602 (Fed. Cir. 1987).

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<sup>1</sup> MPEP § 2142.

The Examiner opines that "since the use of a 3-sector cell or a 6-sector cell is well known in the art as their selection depends on factors such as cost, bandwidth capability, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate Rha's teaching to modify the above teachings of Schaeffer for applying the same cell layout (frequency reuse factor of 2) in a cluster of four cells having 3-hexagonal sectors as well, for utilizing advantages provided by 3-sector cells over 6-sector cells such as cost, bandwidth reduction." Office Action at Pages 4-5, paragraph 6. The Applicant respectfully disagrees, and submits that both Schaeffer and Rha fail to teach or suggest the use of six-sector frequency reuse patterns within three-sector cells.

While Schaeffer discloses frequency reuse methods using six-sector cells, and Rha discloses frequency reuse techniques using both six-sector cells and three-sector cells, the Examiner is incorrect in asserting that it would have been obvious to one of ordinary skill in the art to modify Schaeffer's six-sector frequency reuse pattern for use within Rha's three-sector cell architecture. As discussed above, Schaeffer is directed to frequency reuse techniques employing 12 frequency sets assigned to clusters of four cells having six sectors per hexagonal cell, while Rha discloses frequency reuse techniques employing 12 frequency sets assigned to clusters of four cells having three sectors per hexagonal cell. In order to modify Schaeffer's six sector cell frequency reuse technique to incorporate Rha's three-sector cell architecture, the Examiner must point to some teaching or suggestion, in either reference, that would provide the motivation to transform Schaeffer's six-sector cell into a new three-sector cell and assign two of Schaeffer's 12 frequency sets to each new three-sector cell, or, conversely, merge Schaeffer's 12 frequency sets into six new frequency sets and then assign each of these new frequency sets to two different sectors of Rha's four cell cluster. Neither Schaeffer nor Rha teach or suggest the motivation to perform these modifications.

Moreover, the Applicant respectfully submits that the Examiner appears to be engaging in impermissible hindsight reconstruction to support the finding of non-obviousness. While a reference can be utilized for all that it teaches, focusing on isolated portions of the reference or picking and choosing only that which supports a holding of obviousness is improper. See, e.g., Panduit Corp. v. Dennison Mfg. Co., 1 U.S.P.Q.2d 1593, 1602 (Fed. Cir. 1987).

Consequently, the Applicant submits that one of ordinary skill in the art would not combine the teachings of these references.

***(2) The References Are Not Properly Combinable Because Their Intended Function is Destroyed***

Moreover, the Examiner has not demonstrated that the references are properly combinable. For example, in order to combine the three-sector cell architecture disclosed in Rha with the six-sector cell frequency reuse pattern disclosed in Schaeffer, Schaeffer's basic cell architecture, consisting of six directional sector antennas each radiating into 60° areas of the cell, must be significantly modified, i.e., e.g., by combining two adjacent, 60° sectors into one 120° sector, by assigning two channel groups to one 120° sector, etc. None of these modifications are taught or suggested by Schaeffer, as noted above. In other words, the three-sector cell architecture disclosed in Rha can not be combined with the six-sector cell frequency reuse pattern disclosed in Schaeffer because Schaeffer's cell, consisting of six directional sector antennas each radiating into 60° areas of the cell, will not function as intended.

Accordingly, because the Examiner has not pointed to some teaching, suggestion, or motivation in the prior art to combine these references, and, additionally, because the combination of Schaeffer and Rha would destroy the intended functionality of Schaeffer, claims 16, 21 and 30 are not rendered obvious under § 103(a). Accordingly, claims 16, 21 and 30 are allowable over the cited references. Claims 17–20, depending from claim 16, claims 22–23, depending from claim 21, and claims 31–33, depending from claim 30, respectively, are also allowable, at least the reasons discussed above.

In view of the amendments and remarks presented above, the Applicant respectfully submits that claims 16–33 are allowable. Accordingly, the Applicant requests that the Examiner reconsider and withdraw the pending § 103 rejections.

CONCLUSION

In view of the amendments and remarks submitted above, the Applicant respectfully submits that the present case is in condition for allowance. A notice to that effect would be greatly appreciated.

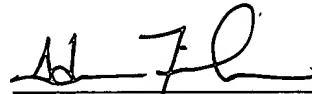
The Examiner is invited to contact the undersigned at (202) 220-4294 to discuss any matter concerning this application.

The Office is hereby authorized to charge any fees or credit any overpayments arising from this communication to Kenyon & Kenyon's Deposit Account No. 11-0600.

Respectfully submitted,

KENYON & KENYON

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Adam M. Treiber (Reg. No. 48,000)

1500 K Street, N.W.  
Washington, D.C. 20005  
(202) 220-4200 (phone)  
(202) 220-4201 (fax)

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